

# AVIATION

*The Oldest American Aeronautical Magazine*

DECEMBER 19, 1927

Issued Weekly

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An Army blimp passing over the radio towers at Arlington, Va.

(Acme)

VOLUME  
XXIII

## *Special Features*

NUMBER  
25

The D.H. "Tiger Moth"  
The Air Cooled Liberty  
The Second National Aeronautics Conference

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TOLEDO  
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# IT'S IN THE AIR



THE man in the world is thinking about aviation. Not merely of the sensational flights successful or tragic, which have captured the news of 1937, but also of commercial flight. He doesn't know much about it. But he's looking forward eagerly to the day when aviation will be for him. And he is expecting great things—soon, first, in the future.

All of us connected with the manufacture and operation of aircraft are inclined to feel that aviation is ahead of public opinion. We know that thing is well-designed, well-constructed machines handled by competent pilots is a safe, swift and enjoyable form of transportation. The public, however, does not! It admires the speed—but it is still a skeptic about safety and equipment.

The industry has succeeded remarkably in its mechanical development of aircraft. The wonderful

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More than 4 000 miles daily is the routine performance of the "Wasp" equipped Boeing mail ships. Over plain and desert, the high Rockies and Sierra Nevadas, through heat and cold, rain and fog, the modern "Pony Express" carries on.

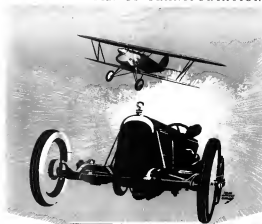
This difficult mission requires the utmost skill and daring of the pilot and the finest equipment. The success of the Transcontinental Air Mail is the outstanding feature of American commercial aviation.



THE  
PRATT & WHITNEY AIRCRAFT CO.  
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DEPENDABLE ENGINES

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The staccato roar of powerful motors  
... on land ... in the air ... energy  
in fuel ... volatility ... limitless force.  
**NATURAL GASOLINE**  
(Use NATURALINE for Airplanes)



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A-3 "Falcon" Two Seater Ground-Attack Type

SEVEN modifications of the "Falcon", standard two-place observation airplane of the Army Air Corps, are now being produced for the military air forces of the United States.

The "Falcon" is being produced as an observation plane with either the Curtiss D-12, the Liberty, or the Pratt and Whitney Wasp engine, for the Army Air Corps and the Marine Corps.

It is also being produced as an attack plane with the D-12 or the Wasp engine for the Army Air Corps and the Marine Corps.

Thus — like the single-seater Curtiss "Hawk" — the original "Falcon" has evolved into a series of two-place types, each being particularly fitted to fulfill some special requirements of military air operations.

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Offices:  
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Factories:  
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If anyone is in position to judge the merits of commercial planes, certainly it is the Department.

It is significant that with complete knowledge of American ships and their manufacture the Department of Commerce should include Laird in equipment for its inspectors.

**We urge responsible commercial plane users to allow us to demonstrate Laird ships without cost or obligation.**

Probably no other organization is in as close touch with commercial aviation as the Department of Commerce. We are rightfully proud of the fact that Laird ships N-5-9 and N-8-10 have been purchased for transportation of its inspectors.

This is singular recognition of the sturdy quality in Laird design and manufacture. Recognition from those

well qualified to judge.

Thus specification by the Department of Laird ships, combined with the complete Laird victory in placing one-two with two entries in the National Air Derby, September, 1927, is quickly

bringing Laird to the foreground in American aviation.

Commercial plane users are invited to send specifications for our suggestions.

E. M. LAIRD AIRPLANE COMPANY • 4500 West 83rd Street, Chicago, Ill.

*Our standard is value in fact, not words, and we stand by it.*



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**AVIATION**

The Oldest and Only Trade Weekly Aircraft Publication



## "Nothing accepted on past performance"

THESE five words express the platform and governing principle of the research program now under way in the shops, laboratories and draughting rooms of The Glenn L. Martin Co.

No element of design—no detail of construction—no item of material is being approved for further use with-

out re-study and scrutiny and an exhaustive search for something better, even though the margin of the particular improvement achieved may seem in itself insignificant.

Out of this research notable and far-reaching advances in the art of aeronautics are taking form.

**THE GLENN L. MARTIN COMPANY**

Bureau of Quality Aircraft Design and  
Development  
GREENLAND, OHIO





The FAIRCHILD CABIN MONOPLANE was the first commercial airplane fitted with Bendix Landing Wheels and Brakes. These proved so satisfactory on the Lindbergh line that they are now fitted as standard equipment.

## Announcing BENDIX wheels and brakes for airplanes

Bendix Brakes and Bendix-Ladden  
Wheels are now in production in  
all standard sizes.



Wheel and brake form a single complete unit, possessing these important features—

perfect streamline	high efficiency
unsual strength	light weight
precision-built	water-tight

The Bendix Brakes specially designed for Airplane service are constructed on the same basic principles as the internationally known Bendix Automobile Brakes.

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General Office and Plant—South Bend, Indiana  
Division of Bendix Corporation—Chicago

# BENDIX 4 BRAKES

FOR SAFETY



The Oldest American Aeronautical Magazine

Vol. XXIII

DECEMBER 10, 1927

No. 25

### The Washington Conference

CONFERENCES and sometimes are wonderful things for almost every one seems to have a different point of view and it is almost impossible to reach even an approximately unanimous agreement on anything. The Department of Commerce conference on commercial aviation was no exception. There were almost as many points of view as there were people present but there is no doubt that the conference was valuable in all those who attended and that many good ideas were brought forward. On the whole the meetings recently examined the actions of the Department during the past year but expressed the hope that the month-long would not be greatly extended or complicated.

The meeting voiced the sentiments of men who have worked hard and who have had their work rewarded by expansion and good prospects for the coming year. There was a spirit of cheerfulness, humor and a desire to get together and cooperate which was markedly different from conditions in the aeronautical industry a few years ago. Outside of a few professional malcontents and a few unrepentant wallflowers almost all the speakers presented viewpoints which were constructive and free from less than idealistic spirit than in the past.

Up until last year, meetings of the aeronautical industry have been meetings of military men. The year's was probably the longest aeronautical conference ever held in this country. It is to be hoped but there will be another conference next year.

### The Twenty-fourth Anniversary

ON DEC 17, the twenty-fourth anniversary of the first flight in a controlled airplane was celebrated. For many years, this has been the occasion of a review of the progress that has been made in aviation since Orville Wright first flew his experimental plane a few hundred yards at Kitty Hawk. This year there is so much to review that it would require a whole issue of AVIATION to give even the narrow outline of the progress made.

So long in the future two very important matters stand out in the general recollection. The first is the first departure of the first airplane that ever flew. Last year, every American was started to read that Mr. Wright had decided to place this great scientific and historical exhibit in the South Kensington Museum in London. Fortunately it was later learned that such a position was only to be temporary. The public then emphatically expressed its desire to see that the first machine to fly by placed in an American museum in a place worthy of its importance. Unfor-

tunately, the Langley tradition has always backhanded the efforts of the Smithsonian Institution accordingly, so that it cannot be expected that Mr. Wright would permit his precious exhibit to be permanently given to a museum which he has longed for in the past. It is a regrettable situation but one that cannot well be changed except by a demand on the part of the public. This should be forthcoming without delay and the year of the twenty-fourth anniversary of the first flight should find this sentimentally removed.

The other decision to be made rests with Congress. A bill is to be introduced carrying an appropriation for a memorial to mark the site of the first flight at Kitty Hawk. At the last session of the 66th Congress a bill, introduced in the Senate by Senator Hiram Bingham and in the House by Representative Warren, was passed and signed by the President, which provided for the erection of a memorial at Kitty Hawk, North Carolina, where on Dec. 17, 1903, Orville Wright made the first successful flight in a heavier-than-air machine. The bill created a Commission composed of Secretaries Davis, Wilbur and Hoover to decide upon the type of memorial, and the report of this Commission is expected shortly. Congress in its present favorable attitude towards aviation will undoubtedly see that this project is given early consideration.

### The Ideal Training Plane

AN IDEAL training plane for civilian instruction would be different in many important characteristics from the commercial plane, which are now employed for the purpose. For example the training plane need not have the speed nor the high speed of a plane designed for all around commercial work but on the other hand it should be more heavily built so as to withstand the rough usage of the beginner. On the aerodynamic side the difference between a commercial and a training plane are not so undeniably separated for there are many who still believe that it is safer in the long run to learn on a plane which is tricky and hard to fly.

A plane for training would be of comparatively low horsepower and it should be so ruggedly constructed that it would be cheap to maintain. Its actual cost should be low so the finish and detail would not have to be as refined as that required for commercial planes. In brief, a plane specially designed for training purposes would certainly be more economical and give better results than one which was primarily designed for passenger carrying and for cross-country work.





as obtained on attempt is not made to interfere in the war or police interest.

When Assistant Secretary MacCracken had called the Tuesday meeting to order he made the announcement that the Washington Chapter of the N.A.A. was given a luncheon at the Hotel Macdonald in honor of Maj. Gen. Henry M. Pringle, the retired chief of Army Air Corps and that all delegates, who wanted to attend were cordially invited to do so.

The first subject to be brought up for discussion was the Department of Commerce proposal to schedule the present transport pilot's license into five classes according to the gross weight of the plane.

The classes proposed were: 1. 2500 lb. or less; 2. 2500 to 3500 lb.; 3. 3500 to 5000 lb.; 4. 5000 to 7500 lb.; 5. 7500 lb. or more.

The usual disagreement was prevalent and C. N. Jones and Richard H. Deppes, Jr., opposed the discussion in general as it seemed at least agreed any idea that served as a means to discriminate against pilots. It was pointed out that such a measure would not be a single figure.

Major General M. Jones, director of aeronautics, Department of Commerce

opposed plans also a certificate issued to fly them than general by a single figure.

In support of Mr. Jones and Mr. Deppes, Stanley Keane of Sheet Air Service, Inc., said that his company had found that anyone with the regular flying experience required by the present Transport Pilot's license had as difficulty as it is to fly a large plane. Among others, the development of the engine for smaller engines, W. B. Heath of the North Airplane Co., W. L. Deppes of C.A.T., and Major Evans of Southern Airways.

The proposal that the Department create what would be known as the "Master Pilot's License" was met with equal defiance. In the opinion of W. M. Herrell of the Curtis Flying Service, license did not substitute at all in a pilot's ability. He added that he knew of several cases where a pilot of a few hundred hours was a much better flyer than a man with twice that amount of flying time to his credit.

Walter Bush of the Travel Air Mfg. Co. also expressed disapproval of the rule and stated that Colonel Landburgh had very little experience on large planes prior to his service in the Air Guard and that on this theory he might not have qualified as a Master Pilot even though he was able to fly across the Atlantic and to pilot almost any type of plane.

Mr. Vandegrift brought out the point that operating companies would not pay any particular attention to an applicant's certificate, as it was concerned with how to perform in an actual flying test. Mr. Herrell also stated similar views and added that in actual practice he had always taken his pilot for a test flight before giving them employment regardless of their written record or hours they had spent in the air.

Just before the close of the morning meeting, Mr. Deppes, Jr. addressed the delegates and urged that commercial manufacturers and engineers put themselves

in a position to turn their factories to the production of military planes in case of a wartime emergency. Such is the form of industrial proceedings. Mr. Warner made a point, however, that the department he represented was not a union, but that commercial planes designed with the thought in mind of their possibly being converted for military use, commercial planes should be designed only for commercial use and that his only suggestion was that the engineers' departments of the producing factories might give a little thought as to how best the conversion might be accomplished in the event of a national crisis.

When the conference again continued in the afternoon, Major Young read a most interesting set of figures on airplane accidents and their organizations which had been compiled by the Department of Commerce. The figures are as follows:

#### ACCIDENT REPORT (Commercial Airplane Operations) Nov. 1, 1937 to Oct. 31, 1937

TOTAL ACCIDENTS	PERSONNEL
PILOTS	
Fatal	10
Serious	10
Minor	10
Total	30
Passengers	
Fatal	10
Serious	10
Minor	10
Total	30

CAUSES	PERSONNEL
Weather	10
Human Factors	10
Equipment	10
Procedural	10
Other	10
Total	50

PILOTS	PERSONNEL
Fatal	10
Serious	10
Minor	10
Total	30
Passengers	
Fatal	10
Serious	10
Minor	10
Total	30

#### EXPERIMENTAL FLIGHTS

TYPE	At Airports	At Other Places	At Both	Total
Total	10	10	10	30
Fatal	10	10	10	30
Serious	10	10	10	30
Minor	10	10	10	30
Total	30	30	30	90

#### AIRCRAFT ACCIDENTS INVOLVED INTO WAR SERVICE

TYPE	At Airports	At Other Places	At Both	Total
Total	10	10	10	30
Fatal	10	10	10	30
Serious	10	10	10	30
Minor	10	10	10	30
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Minor	10	10	10	30
Total	30	30	30	90

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TYPE	At Airports	At Other Places	At Both	Total
Total	10	10	10	30
Fatal	10	10	10	30
Serious	10	10	10	30
Minor	10	10	10	30
Total	30	30	30	90

#### APPROVED AIRCRAFT

TYPE	At Airports	At Other Places	At Both	Total
Total	10	10	10	30
Fatal	10	10	10	30
Serious	10	10	10	30
Minor	10	10	10	30
Total	30	30	30	90

#### EXPERIMENTAL FLIGHTS

TYPE	At Airports	At Other Places	At Both	Total
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Minor	10	10	10	30
Total	30	30	30	90

that various ratings were really put into practice. It was pointed out by Mr. Parker that on almost automatic increase in the rates of general insurance would eliminate the need of making an exception clause against those who fly occasionally.

The days session was closed with the reading of the report of the committee which had been appointed to go over the Handbook. The committee recommended a number of changes, but the meeting was in unanimous agreement that a handbook was necessary.

C. C. Jones pointed out that the decision was pending as to the general feeling of the Conference as expressed at the meeting. In reply Mr. MacCracken stated that under his regime it had been and would continue to be the custom to consult the industry before making any major changes in the regulations.

The new Handbook differs from existing regulations in many respects and also enlarges upon them. It was stated that it would not be put into force before July 1, 1939, and that the changes would not be retroactive.

The Wednesday morning session was devoted to discussion on the question of flying schools. An objection was raised to the statement that the student training was based on a unit system. An objection was also raised to the statement that the student training was based on a unit system.

Mr. Heath is responsible for the statement that present flying school advertising was somewhat misleading stating that he did not believe that the majority of schools told these students that they were a flying school after having solved for 10 hours.

He added that every student who came to his school for instruction was first questioned as to what he intended to do after he had learned to fly. That each student was informed that although the school would do everything possible to assist him when he had a hard time in the beginning, the government was employed in the aeronautical industry.

One of the delegates gave the warning that schools should clean up their advertising so that it would be done for them by the Better Business Bureau, much to their discomfort and annoyance.

In referring to the safety in allowing students to solo J. Carroll Stone stated that it depended fully upon the ability of the school. However, he did not feel that schools should allow pilots to become instructors until they had passed examinations. He advocated that good instruction now would help aviation in the future.

Chas. Chandraha stated that in his opinion 10 hours instruction was sufficient, and that in many cases a student could be safely solo solo with less time. He brought out the point that learning to fly today was not to be compared with the manner in which it was done in the War, in view of the fact that a considerable number of young men and boys are now interested in learning model airplanes, etc., and, therefore, no



William B. Stout, of the Ford Motor Co., Detroit, Mich.



J. Wilson, controller of road aviation in Canada.

over a very good ground education before taking up actual instruction. He also stated that out of 255 places that he had sold between 50 and 90 per cent. at those had been sold to new students who had school with from 5 to 30 hours instruction, and that as far as he could check, not one of the pupils ever had been killed. In regard to getting additional experience Mr. Chamberlain suggested three ways:

- 1 To take the Army course of 200 hours.
- 2 For the student to buy his own plane.
- 3 For the student to take the flying school course and then get a job with an air line.

M. M. Merrill of the Customs Flying Service stated that a student could get additional experience by carrying on in the

Army Service, but the cost of this would be too high to need one. He suggested that the Department must raise the standard of qualification for a private pilot's license. However, Mr. Merrill felt that nothing should be done in reference to raising the standards for the schools for at least one year or two, since the present phase of the industry was rather weak, and that in all probability the schools would take care of their individual problems. In the matter of Chamberlain's suggestion, he stated that he recommended a man's flying ability as only 50 per cent., and that rather than the applicant's flying time being a guide, the man's personality and ability to impart his knowledge to others was what counted.

Charles B. (Coney) Jones, of the Customs Department of Motor Car, Ford, General, etc., L. L. R. T.

Mr. Coney speaking from the standpoint of a student under taking the training stated that he considered it to be a worthwhile undertaking for a prospective flying student to attend an automobile school or some sort of a ground school before taking instruction in the air, so that when that time comes he would have some idea as to what was taking place while he was flying.

W. J. Sawyer said that out of 740 applicants received by his school only three had been rejected as the result of a bad back. He went on to say that in some cases where a student is rejected and the man's money returned he goes elsewhere and learns to fly. He stated that in his school a man receives a letter to a little over 25 hours. The average student goes solo after 25 1/2 hours of instruction, he then gets solo for a short time and then receives about 4 hours extra dual instruction. He also stated that before a man goes solo he receives an extensive ground school training. In connection with prices charged for flying schools Mr. Sawyer stated that in Japan it cost \$200.00 to learn to fly, in England it cost \$150.00 and in Germany it cost \$25.00 for about 15 hours time in the air.

C. D. Child of the American Eagle Aircraft Co. of New York expressed the opinion that the best number of instruc-

tors the better it would be for aviation, and made a plea that the industry be allowed to grow, by the fly-in, which being encouraged rather than discouraged by the application of numerous rules and regulations.

The statement of opinion in reference to aviation school was that they be allowed to develop themselves but it had another year before being put under any sort of restriction to speak of.

In commenting on the school situation in Canada Mr. Wilson said that after the war there had been a great influx of pilots in that country and that it had not been very long since any more for the time being. Recently, however, the Canadian government had tried to encourage the line of aviation. According to Mr. Wilson the policy of the Canadian government is to keep private training in the hands of civilian schools, but where a pilot showed aptitude and had been definitely offered a job, if he checked further it was the government gave him a course of about 50 hours. The government also offers a course to private school instruction with the idea of encouraging a more uniform system of training. Mr. Wilson added that Canada also expects to encourage the training of pilots through the formation of light plane clubs in which some of the material will be furnished by the government.

When the question of regulations governing flying lessons the United States and Canada were brought up Mr. Wilson said that before long all places would have to be set at a regular part of duty, but for the time being pilots had to rely on the civilian officials at their selected point of reference to their plan to land at that point. In reference to referring to the country Major Young explained that the same arrangement would be necessary.

Earlier in the conference the suggestion had been made that the state tax on gasoline used by airplanes be removed, and at this point the meeting was referred to the State of Florida was contemplating whether to use the tax funds for the improvement of its airports as to make the tax exempt altogether. There in the State of Illinois receive a relief every month, according to a representative of the aviation section. It was stated that the State of Washington makes an annual refund of one cent out of the two cent tax whereas the State of Illinois refunds two cents of the tax.

In the discussion of the revenues had increased considerably and the aviation accommodations in the Department of Commerce of Chicago will be done in real earnest. It was announced that it was announced at the close of the Washington conference, when the conference would convene in the future in the fall of 1933.

The Thursday morning session, after being called to order by Mr. MacKenzie, was opened over to Major Young.

point. It was stated that the Department had prepared printed data in proposed regulations governing the rating of airports, in a pamphlet entitled "management and administration of airports," reports and suggested field rules. Copies were distributed and then Mr. White said that the report of the airports was the subject of the preliminary statement. Mr. York had been changed as the result of holding another conference to be held this committee would meet next month in New York to discuss airport questions.

In a long report of the second meeting, William E. Arden, chairman, stated that the report was in the form of a suggestion and that the principal one was that the Department prepare a rating of airports for use now. Arden said that the Department expects cooperation with other and commercial, that the bulletin be revised to give more specific instructions and that the Department would be glad to make studies in the field to make studies for 24 hour flying, that William Chamberlain emphasize so as to give better reports, and that a field manager be appointed to have full authority on matters in the New York report of the committee.

### Rating of Airports Suggested

In opening the discussion on this subject, Major Young explained as to the effect such a rating would have on the field work, which spent time and money, and then when the rating was through found that it covered an rating of all airports. Mr. Arden stated that it is his intention the next day to discuss much about airports at present, and that, surrounding general, they have a big effect in the rating of an airport in the near future. It might become necessary to raise the surrounding security according to Mr. Wilson and that it would be advisable to wait until that time. A contrary view was expressed by Mr. Fellows of Detroit who expressed the belief if ratings were set off until some time it is possible that many buildings would never have a need airport. He favored an immediate rating by the Department at an early date.

Paul L. Foster of Cleveland & Smith brought out the point that if an airport was outside the city limits that it was easy for the flying would never be done. In his opinion it would not be advisable to delay rating airports but air travel be improved.

### Emergency Power Immediate Rating

Several other reasons for not delaying the rating of airports were presented and it became evident that the majority of the present felt that rating airports now would not be a matter of minor cities and by having down systems in place, it was in part what was required for various rating it would help least groups to get financial backing from the state or community officials. Back by votes that already had a point established, discussed a recognized rating was in general held, and, and, was passed on by Mr. Johnson of Chicago. It was stated that the Department had a list of 25,000 to 30,000 people and that it was one of the ratings should encourage to build airports that has more than with been agreed on before they are set.

It was suggested for some sort of rating information to be immediately forthcoming. Mr. Trenchard of New York City of have the city of New Orleans had experienced some trouble and inconvenience in securing an airport to the construction of its citizens as to just what was

required for a first class municipal airport. In his opinion the lack of information in a community was a serious handicap block as regards obtaining funds for the construction of an airport and he left that the Department and members of the industry ought to educate municipalities along that line. And not only that, but that public should be educated early established airports wherever possible.

Just before the morning session was adjourned J. Dick Alexander made the request that the national manufacturers be present next during the next term to discuss the formation of a manufacturers' organization.

At the meeting S. S. Stanley of the Aeronautical Chamber of Commerce of America explained the workings of that organization and the value it would be to a commercial airplane manufacturers' organization. He said such an organization should work as an educational body within the Chamber. After some discussion as to whether the manufacturers' group should be formed within the Chamber or outside of it, a vote was taken. The suggestion were in favor of forming within the Chamber. A more complete account of this meeting appears elsewhere in this issue.

Due to a still greater increase in the number of attending delegates the Thursday afternoon session was held in a larger room in the same building. Major Young opened the session and explained the purpose of the airport data that had been distributed in the morning. The rating of airports, explained Major Young, would be based on three points, 1, general facilities and equipment, 2, night flying equipment, 3, and fire protection. The rating of an airport, added Major Young, would be as of the time of inspection. If the airport rated the standard of one or all of the three points provided that the original rating was not the high as possible the rating would be increased in proportion. The same idea applied in the event that the standard of any one of the three points became lower. Major Young made it clear that the highest rating possible was a standard of A for each of the three points. And that the rating X indicated that particular point was not equal to the Department's lowest rating. The rating symbols will follow in order as voted at the meeting. Thus, if an airport had no night flying equipment whatsoever, but was of the high standard in the other two points, its rating would be A-X.

As regards rating airports in Canada Mr. Wilson explained that the matter of airports was not as developed in that country as in the United States, but that the Canadian government must advance all costs and responsibilities to obtain as much as possible but suggested that bills money be spent on airport equipment until such time as air travel warranted such expenditures. In other words, they advised that the Department as an airport cost with its own.

Additional material was distributed by the Department as proposed regulations governing the rating of airports, information.



C. B. J.



Lieut. Alfred F. Meyerhopper

F. J. Johnson, Department of Commerce, President of the Conference





# The Air Cooled Liberty Engine

V-1410 Developed by the Allison Engineering Co. With the Army Air Corps



Front and rear of the Allison V-1410

By N. H. GILMAN

Chief Engineer, Allison Engineering Co.

THE TREND toward air cooling, which terms perhaps the most striking feature of present day development in the field of aircraft engines, was clearly realized by the Research Division of the Army Air Corps at McCook Field, when more than four years ago, it initiated the development of air cooling the Liberty engine. Preliminary, logistic and maintenance were made, and a proposal for tests was submitted, calling for the design and construction of an experimental engine. The Allison Engineering Company was selected to carry out this project.

The first engine, designed and built for straight operation, was so successful that the Air Corps was encouraged to continue its development. It was decided, however, that because of better visibility the engine should be designed to run in the inverted position. A further advantage of the inverted type is that even with short air cooled exhaust stacks, which increase fire hazard, the ground and rear of the aircraft are divided away from the engine.

During the past two and one half years, inverted air cooled Liberty engines, both direct drive and with propeller reduction gears, have been successfully under test in the Air Corps power plant and laboratory, and on the test blocks of the Allison Engineering Co. The design has been repeated from time to time, until its performance now compares favorably with that of an aircraft engine.

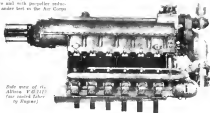
The installed weight of the inverted air cooled Liberty power plant is considerably less than that of the water cooled although slightly greater than that of an air cooled radial engine of the same power.

Although it was necessary to reduce the heat, in operation from the engine fan, the inverted air cooled engine develops

more power than the standard Liberty. The improved results from the use of a rotary induction system, on cool lift and longer valve opening, a better designed intake port, and higher R.P.M. characteristics is permissible because of air-cooling parts.

The Vee type engine is particularly well suited to air cooling, since with a maximum amount of cooling, a 100% air flow is directed on all surfaces of the cylinder barrel and heads. In fact, the engine itself might be said to be its own cooling. A single sheet of aluminum radiates from the open part of the Vee, together with a back plate of aluminum forms a deep box, which contains an inner duct for the propeller, and distributes it between the cylinders. In the air intake area of the cooling is some 20 per cent more than the area of the outlet passage, sufficient pressure is built up to force the air to flow out at high velocity. It is the inner duct, and valve ports, which insure adequate cooling of these parts. The cooling air freely passes in of the ports in the side of the cylinder and around the piston.

The design of the engine follows generally that of the standard Liberty, the same crankcase and crankshaft being used, as well as the timing gear, drive shaft, pusher drive, governor drive, propeller shaft and linkage. The inlet valves, exhaust valves and passages, valves, springs and other parts are of new design. A larger oil pump and oil filter (oil pump) are employed for the inverted type.



Side view of the Allison V-1410 (Air Cooled Liberty Engine)

The addition of a rotary induction system permits the use of straight intake manifolds and single exhaustors. The crankshaft bearings are made quite large and they in turn fit snugly into which the valve stems and springs dip. It is in this manner through lubrication of the valve stems, but as the crank valve stem of large diameter, are made and partially filled with a fusible alloy, the operation of which causes the oil to flow from the valve head to the area of where it is required. In the oil thereby forms an integral part of the cooling system.

The oil is conveyed from both ends of the bearings by double port pumps located on the left and right of each bearing. The oil is discharged into the lower part of the bearing at the end of the crankcase.

The cylinder heads, which project approximately two inches from the crankcase, the space around them forming an adequate space which collects the oil from the crankshaft bearings, that scraped off the cylinder walls and the discharge from the crankshaft scavenging pumps. Double scavenging pumps, on top of the crankcase, pump the oil from both ends of this space and force it through the jackets on the crankcase and exhaustor above, and return to the supply tank.

Built integral with the scavenging pump is the pressure pump, which maintains a pressure of 100 lb. per sq. in. on the crankshaft bearings. A somewhat lower pressure is used in the exhaustor bearings.

Materials used in the various parts of the cylinder head, the valve stems, as best suited for the particular work each part is subjected to. The barrels with their integral cooling fins and hold down flanges are machined from tempered steel forgings. On the head and is machined a twelve pitch thread, and one half inches long for attaching to the cylinder

heads. The valve stems and spark plug inserts are of tempered chromium bronze.

The cylinder heads, with their integral cooling fins, are cast in aluminum (Y Alloy), and are heat treated before machining. They are machined to receive the threaded end of the cylinder barrel and the valve stem inserts, drilled and reamed for the valve stem guides, and are tapped for fitting the spark plug inserts; the lower end threads in the heads being somewhat smaller than the outer diameter and threads of the parts fitted into them. To assemble the various parts it is necessary to heat the cylinder head to a temperature of approximately 650° F., the other parts being at room temperature.

When the cylinder head is cooled, the component parts of the assembly are held together under considerable tension. This method of assembly makes sure of good lock free through the joints and although the cylinder assembly, in operation, will be worked at a fairly high temperature, the difference in temperature of the various parts will never be great enough to allow their loosening.

After the cylinder assembly has been made up as above, it is subjected to a hydrostatic test of 400 lb., after which the valve stems are finished and the cylinder head ground to size.

The carburetor (high speed flow) type of rotary carburetor is used on the air cooled Liberty. By its use a single carburetor can be employed to supply all twelve cylinders. Furthermore, the high speed of the impeller allows work through saving and atomization that all carburetors require a uniform mixture, although the simplest form of carburetor carburetor are used.

A vehicle's characteristics of the carburetor is that both capacity and pressure increase more rapidly than the speed, and so the amount of charging increases with the speed, thus increasing the natural decrease of volumetric efficiency which would result if the intake depended on vacuum only. Then at 1500 rpm on wide open throttle the pressure in the manifold is approximately 15% in of mercury above atmosphere, and at 1000 rpm is 25% in.

The carburetor delivery assembly is built up as a unit, and mounted on the left end of the Liberty crankcase, being



Side view of a Curtiss pursuit plane equipped with an Allison V-1410 engine





Side quarter view of the D.H. biplane "Tiger Moth".

## The D.H. "Tiger Moth"

British Experimental Monoplane Flies 186.5 M.P.H. at an Altitude of 20,000 Ft. and Lands at 60 M.P.H.

THERE HAS been considerable interest shown in the past few months in the D.H. biplane "Tiger Moth," built by the D.H. Aircraft Co., Ltd., from Longbridge, Birmingham, England. This plane has been certified with 186.5 mph and an altitude of 20,000 ft. (which is no mean feat). It has been powered with both a 100 hp D.H. biplane engine and the 100 hp Gnome Motor H engine.

The Tiger Moth is essentially a racing plane being very similar to both the Supermarine S.5 and the M.20 Schneider Trophy contender.

The plane is an experimental low wing monoplane with the wing braced by wires. The engine which fits the cylinder in line is forced right back in the tail with tail in front in the landing for the pilot's head. The windshield is on hinges and is a part of the fuselage. The first Tiger Moth was built with a four cylinder air cooled Gnome engine which was later replaced with a special engine designed by Mr. F. D. Halford and Captain D. B. Hood.

The Tiger Moth has made possible experiments with very high speeds at a reasonable cost. It is a 100 hp aircraft mounted on a monoplane and gives a very high performance in addition to being very useful for research work. The plane is an excellent racing machine and can also be used for small engine dual power. It was originally planned that two of these planes were to be entered in the Schneider Trophy race this year in England. The first plane was fitted with a Gnome engine which was later replaced by a special engine engine developed by Mr. F. D. Halford and Captain D. B. Hood. The D.H. biplane engine developed 120 hp, though it rated at only 90 hp. It has cooling fins on the bottom of the engine eliminating an oil radiator. A detailed description of the Gnome engine will appear in an early issue of AVIATION.

Unfortunately the second plane fitted with a Gnome engine was not completed in time and only the D.H. engine plane

completed in the race. Capt. H. A. Broad, A.F.C., set 186.5 mph world's speed record at 186.5 mph in the D.H. biplane "Tiger Moth" on Aug. 25 of this year. Two days later a 90 mph was achieved in an altitude of 20,000 ft. in 17 mph. However, he did not reach the ceiling which is thought to be in the vicinity of 20,000 to 25,000 ft.

The D.H. biplane "Tiger Moth" on most days reaches the 20,000 ft. altitude in 17 mph. The engine is a 100 hp Gnome engine. The landing gear of the engine is a pilot and the method of landing the wing design from the D.H. 51. The landing gear on the D.H. 51



The "Tiger Moth" in flight with Captain Broad in it.

of the fuselage and the wings are fixed where it meets the fuselage. The struts, as has been mentioned before, operate by torque tubes and the gap between the struts and the wings is filled with sponge rubber. This moderates all sorts of vibration and the movement of the movement of the struts compresses the rubber on one end or the other. The gap between the struts and the fuselage is filled in the same manner.

The advantages is based by two struts in addition to two struts from the side of each wheel to the wing spars, and another wire between the wheels. The shock absorbers are of the rubber and type and mounted within the wheel. The arrangement is very simple and reduces the parts are maintained easily. Of course, it must be remembered that the plane is quite light and that a large shock absorber is not necessary.

The Tiger Moth has a landing speed of 60 m.p.h. which is quite slow for a plane of the type. It is stated by the same designer that when considering wing area it was decided that it would be best to obtain a high top speed at the expense of an extremely high landing speed, as has been so often done in the past by the designers of racing planes. The fuselage is constructed of two laminations of spruce built on a jig and glued and screwed to the longerons.

The general specifications of the D.H. biplane "Tiger Moth" are as follows:

Span	32 ft. 8 in.
Length	25 ft. 10 in.
Wing area	375 sq. ft.
Adverse area	303 sq. ft.
Stabilizer area	55 sq. ft.
Revolutions	7 ft. 10 in.
Pin area	22 sq. ft.
Roller area	4.5 sq. ft.

Empty	115 lb.
Engine (100 hp)	124 lb.
Oil (2 gal)	20 lb.
Pilot (Capt. Broad)	115 lb.
Total weight	274 lb.
Total weight	800 lb.
Wing loading	11.5 lb. per sq. ft.
Power loading	696 hp per hp.
High speed over 100 km. course	186.5 m.p.h.
Landing speed	60 m.p.h.
Height altitude	20,000 ft.
Estimated ceiling	25,000 to 30,000 ft.



These are drawings of the D.H. "Tiger Moth".

is fitted with rubberized wheels above the upper longerons. The engine is very good considering that the pilot is almost directly behind. As there is only a small space available in the front of the cockpit is a quite original. They operate in the most manner by a stick and pedal. The stick is attached to a crank which through a mechanism actuates the ailerons by a torque.

The wings, which are loaded up to 11.5 lb. per sq. ft., are set near the bottom of the fuselage and braced with wires to the top of the fuselage and the landing gear. The wings are of conventional construction with 1 section upper spar and conventional ribs. The wings are built in two panels, the spars forming a butt joint on the center line of the wings. The spars, of course, pass through holes in the sides

of the fuselage and the wings are fixed where it meets the fuselage. The struts, as has been mentioned before, operate by torque tubes and the gap between the struts and the wings is filled with sponge rubber. This moderates all sorts of vibration and the movement of the movement of the struts compresses the rubber on one end or the other. The gap between the struts and the fuselage is filled in the same manner.

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## Two Laird Commercial Biplanes Completed for Dept. of Commerce

THE E. M. LAIRD AERIAL CORP., of Chicago, Ill., recently completed two Laird Commercial biplanes powered with Wright Whirlwind engines for the Department of Commerce. The first was for Robert Galt and the second for Clarence M. Young, chairman of the Board of the Department of Commerce. The E. M. Laird Aerial Corp. is active in the standard Whirlwind models in planning two Pratt & Whitney Whirlwind engines. One is a three-place open cockpit plane for Henry C. Egan of Chicago, and the other is an open closed cabin type for Geo. T. Hargis, also of Chicago. The planes will have a tubular duralumin fuselage and wood wings, as is the standard practice on all E. M. Laird planes. The E. M. Laird Aerial Corp. is also building a number of three place open cockpit planes for private owners and operators.





## Lindbergh Starts Washington, D. C. To Mexico City Non-Stop Flight

AN AVIATION press in press, Ed. Charles A. Lindbergh, following his famous transatlantic flight, the "Spirit of St. Louis", is preparing for the start of a transatlantic non-stop flight to Mexico City from Bolling Field, Washington, D. C. The transatlantic flight took off from the Army field at 12:30 P.M. on Nov. 11 and the last report was that he had been sighted at 10:30 A.M. Dec. 14 as he passed over Houston, Tex.

The take-off, while the "New York to Paris" start was well covered by only a few people. But on the other hand, according to the great flight test men, "colossal" hangings had been



The "Spirit of St. Louis" in flight

heavily loaded plane of the non-stopped surface at Bolling Field in a showing of superb gliding skill when it started and Army men also believed that Drake was inevitable.

Word that the aircraft would start the 2600 mi. flight came rather unexpectedly at 11:45 in the late afternoon and the surrounding country and crowd were left left Bolling Field in a very condition. However, shortly after eleven o'clock in the morning the first and most to a selected few that he was preparing to start. A study of the Weather Bureau's morning report seemed to have satisfied him as to conditions, that he would consider on route.

As soon as he arrived at the field he made a final inspection of the Spirit of St. Louis which was checked out of his hangar and fueled, according to reports, with 300 gal. of gasoline and 15 gal. of oil. The plane's total weight was stated as being 6700 lb.

### Bide Good Bye to Major Barnwell

Presently Colonel Lindbergh closed his eyes once more, and, posed for photographers, and posed by to Major Barnwell, commandant of Bolling Field, and then climbed into his plane. A few minutes later the Wright Warbird engine was started and given a short test run.

Then finally the pilot waved the crowd away, turned into position, and started down the field away from the crowd, from which the start was made the plane moved from side to side as the wheels hit ruts and soft spots. To the usual group of colorists it seemed as though the plane would never leave the ground. And when at last some could be seen beneath the wheel it was feared that the pilot would be unable to clear the iron on the far side of the field. But with skilled maneuvering the New York to Paris line lifted

the Spirit of St. Louis clear of the tree tops, then set it on the horizon line leaving it in a southerly direction, followed by an escort of four Army, three Navy and one Department of Commerce plane that stayed with him for the first 50 miles of his 2600 mi. air journey.

## Report on Distribution of Load in Biplane Published by N.A.C.A.

THE NATIONAL Advisory Committee for Aeronautics recently published Technical Note No. 505, entitled, "The Distribution of Loads Between the Wings of a Biplane in a Steady Descent" by Richard M. Mack, technical adviser of the trust. The report deals with the experimental results obtained on the wind tunnel by the author. It also deals with the calculations obtained by the analysis of the biplane theory developed by the two German aerodynamicists, Prandtl and Lighthill. In order to prevent any error the tests were repeated using two different airfoils. The experimental results were obtained in the wind tunnel of the Daniel Guggenheim School of Aeronautics at New York City. Tables are given and curves plotted showing the effect of air speed upon the other as well as the distribution of lift between the wings in a biplane.

Copies of this report may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

## Philadelphia Firm Begins Work On Hangar for Keystone Company

THE AIRPORT Equipment Division of the Maryland-Victor Bldg. Co., 516 Philadelphia Bldg., Philadelphia, Pa., has just begun construction of a large hangar for the Keystone Aircraft Co., Bristol, Pa. This hangar is to be used as an assembly building for the large bombers for the U. S. Army for which the Keystone Company recently received the order.

It is stated the Maryland Company, through its Airport Division has just erected in its vicinity the Philadelphia-Victor Airport, which is owned and operated by the Leasing Co. Philadelphia Flying Service, Inc. The second large hangar on the field 70 x 95, has just been completed in approximately 15 days after erection was started. The Leasing Company has just awarded another contract for the enlargement of the experimental shop, covering machine and engine repair work.

## To Discuss Promotion of Gliding Clubs at Dinner Given on Liner

ON DEC. 9 a dinner will be given on board the North German Lloyd 8-8 Columbia at New York for the purpose of discussing plans for the promotion of gliding in the United States. The speakers at the dinner are A. Peter, Harvard Club, New York; E. Peter, Harvard Club, the North German Lloyd and Dr. Goldschmidt. Prominent guests have been invited and there will be confirmed the work to be done by gliders in Germany where over 3,000 students have been trained. Two moving picture films will be shown and a report will be discussed for the furtherance of the movement in the United States. It is the plan of the organizers to begin a study of gliders and to obtain the services of a professional glider pilot.



### Philippine Company To Organize

A commercial aviation in the Philippine Islands is planned by the Philippine Airways, Inc., which recently filed incorporation papers with the Bureau of Commerce and is expected to be undertaken by the new corporation as an agency. To conduct a school for training pilots, maintain an agency passenger, mail, express and freight service throughout the Philippine Islands; engage in aerial photography, aerial survey, exhibition flights; build airplanes and so large of all aircraft, maintain engine, repair and overhaul, aircraft, aircraft and all equipment or airplanes parts by the firm, and to engage in any other undertaking connected with aviation in the Philippines and generally to do all other things and to transact all business as may be required or authorized, mandated or conferred on the statement of the above objects or any of them respectively.

### Bremen Plans Seaplane Port

A company has been founded in Bremen, for the establishment of a seaplane airport on the Weser River, opposite Bremen. The project was of this port will be the village of Bremen, which is situated in the Free State of Oldenburg.

The new organization is called the Weser Seaplane Port Company, and it has the following participants: The German Government, the State of Oldenburg, Prussia and Bremen, the Weser parishes of Wunstorf, Bremerhaven and Bremen, and the associated municipalities of Badbergen.

The idea of constructing a seaplane port on the Weser River dates from the year 1895, when private interest, awarded by the Lower Weser Air Service Company, made the first steps with seaplanes between Bremen and the island of Heligoland.

### Proposed Brazilian Aviation School

There has been introduced in the Senate of the Brazilian State of Minas Gerais a bill to establish a State Aviation School.

The bill provides for its establishment in the city of Belo Horizonte and that it is to be under the direction of the Board of Public Safety. The bill calls for a maximum staff of about 500 men which may be increased for the purpose of property, buildings and machines.

### Air Survey of Rhodesia

In Rhodesia Operating Company's survey expedition, now in northern Rhodesia, Africa, is starting an air survey of the 10,000 square miles of the Zambezi River. The work will be done by photography, using seaplanes operating from the river. The photographs will be used to control points fixed on the river bank by the astronomical ground party. Wireless receiving apparatus carried by the seaplanes will permit the only flight of longitude by reference to an Eshington time. A going back Greenwich time. The survey will be completed by the new year.

### Plan Air Service in Northern Malaya

The Air Survey Co., Ltd., is representing for the operation of an air service in Northern Malaya. The proposal is being discussed by public opinion, and the success of the venture is largely dependent upon government aid and control, or subsidies from the governments concerned. The proposal provides for the organization of a new company to be known as Eastern Airways, Ltd., which will operate a daily air service between Penang, Port Swettenham and Singapore. It is hoped that later the service may be extended to the Dutch East Indies. The company will begin operation at a one place of 300 ft. upon the island, fitted with three engines developing 1,300 hp. and capable of a speed of 135 mph. There will be accommodations for 16 passengers, and a ton of baggage or goods. There will be four other smaller aircraft of 100 hp. capable of carrying six passengers. The service will be available for passengers, mail and light goods and the timetable will be arranged to meet connections with European steam ships. A schedule will be between Singapore and Penang, daily except Sundays, leaving Singapore at 11 P.M. and arriving at Penang at 5:10 P.M. Later a schedule of flights to Batavia and Bismarck will be completed.

### Air Traffic Increases at Copenhagen Port

The number of passengers arriving at and departing from the Kastrup Airport at Copenhagen was 9,352 during the last six months of 1927, which was a much larger number than for the year 1926 and earlier periods. No passenger items earned during the first three months of 1926 or 1925 had during the remaining six months of each year the totals were 3,700 and 5,800 respectively. In 1925 passengers were carried from April through October and the total was 610. The total number of arrivals arriving and departing during the first nine months of 1927 was 2,640 and this also was larger than for the preceding year. For the last nine months of 1926 and 1925, when the service was in operation, the numbers of arrivals arriving and departing were 2,534 and 2,239 respectively.

Of the 6,536 passengers arriving and departing from Kastrup during the first nine months of 1927, 3,219 arrived and 3,317 left. The lowest traffic was between Copenhagen and Hamburg, 1,577 passengers arrived at Kastrup and 1,400 left in this service. Only a few passengers were carried between Copenhagen and nearby towns within Denmark.

### Mining District Uses Planes

As transportation to the remote mining district of Central and Northern Manitoba has been greatly facilitated during the present season is the work of the Western Canada Airways, Ltd., which has operated three airplanes with considerable success. Four extra airplanes and one light plane will be added to the equipment of the company shortly and additional planes are expected to have been ordered for delivery in the spring. Between Dec. 27, 1926 and Aug. 30, 1927, the company has operated nearly 3,000 passengers and 350,000 lb. of express freight.



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AERONAUTICAL  
CORPORATION

San Diego, California

leena Gas and Electric Co. for cost estimates for lighting of field all night. The city will probably be asked to turn a electricity to keep the field lighted. The southeast area of has been lighted through Oklahoma City and the road to lighting the field is very important.

Garage service is now available at the field, with the equip- phone of the Southwest Airways, Inc., garage and hangar. Bob Turbinson is in charge.

At Hensley, former city pilot, and now sales manager for the Southwest Ryan Airlines, Inc., of Tulsa, Okla., was in Oklahoma City recently demonstrating a new model of Ryan airplane. E. H. Holthausen, of Hensley, bought one of these planes recently.

Plans and plans have been tested by the Department of Commerce engineers and have been given official approval.

Mayor Theo Lee Hising, of the Chinese American city, addressed the students of the Oklahoma City University. He also spoke before the Men's Dinner Club. The arrangements for an air congress of the Southwest, to be held in Oklahoma City early in January, are being completed at meetings of the Chamber of Commerce Aviation Committee. The purpose of this convention will be to promote the southwest as a unified program to sponsor aviation and improve the available facilities. Improved landing fields and better working conditions for the cities are also to be considered.

When an official of the Anderson-Peterson Oil Corporation wishes to get somewhere in a hurry, he drives out to the airport of the Southwest Airways, Inc., and starts into the company's plane. The pilot does the rest. In H. P. Field, even one of the company's airplanes at Colorado, Tex., 30 miles away in three hours, whereas it formerly took him 30 hours to make the trip. Bob Turbinson is the pilot of the plane is a six passenger Ryan-Siemens airplane.

### Harrisburg, Pa.

A special committee of the Harrisburg Chamber of Commerce has undertaken a series of flights over the city and its vicinity in an extensive survey of available airport sites.

The field they select will include from 100 to 200 acres, not too far from the center of the city, will be adjacent to highways and free from high buildings, wires and other obstructions.

Proving winds in Harrisburg are southeast and the city is unobstructed by mountains. The field of the U. S. Army Air Service Supply Depot at Middletown, one and one-half miles from Harrisburg, is being used as an intermediate landing field at the present time.

The Chamber of Commerce Committee is headed by Frank A. Robbins, Jr., chairman, who is general manager of the Harrisburg Steel Company, and includes George E. B. of the Harrisburg National Bank; Harry T. Neale, local oil broker; Albert L. Allen, insurance broker; F. Bennett, local business attorney; and Herbert W. Spang, of the Division of Trade Companies.

### Johnstown, Pa.

Walter D. Snyder, assistant assistant superintendent of the Pennsylvania Division, Department of Commerce, has come to the city and inspected trip to available sites for this proposed municipal airport.

### Philadelphia, Pa.

By Ray Brown

Among those who attended the National Aviation Congress at Washington D. C., from the Philadelphia area were Charles Townsend Laddington, president of the Philadelphia Flying Service, B. Stanford Seltzer, Jr.,

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For preliminary plans, approximate cost, etc., wire, phone the nearest Austin office, or mail the memo below for a copy of the latest Austin booklet on aviation problems.

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## PUBLISHER'S NEWS LETTER

The subject of airports is being considered by so many cities that it is perhaps timely to submit the views of publishers to be observed in the European development. At first, practically all of the fields of Europe have passed through two of the three stages of progress. As first flying fields served for all the aeronautical activities that were being conducted. A flat plot of ground and a hangar were all that were necessary for this work. There were considerable aerial services then but this has not developed in Europe as generally as it has here. When air lines started to cross Europe the need for the airport came and there have usually come to be regarded as a flying station on one of the regularly established air routes. These have served their purpose well in the earlier periods of air transport development but now are being turned into what may be called air parks for the use of a better type.

The air park idea has been developed not only as an added convenience to air travelers, but to increase the revenue of the field. No longer is a considered good position to receive or land passengers on the fields of Europe, or even a small ticket office. Now, restaurants, and gardens, automobile parking spaces, amusement features and hotels are being added to the old structures, making them air parks where many people who do not fly can enjoy a visit to the field. Instead of catering to the flying public alone, the companies that operate the air parks appear to have become convinced that the general public will use air parks surrounding flying fields in the same way that other parks are enjoyed. At Cologne near London, La Bourgas near Paris, Tempelhof in Berlin and many other European cities the air park idea is changing the airport of several years ago in the air park of the future.

The changing condition has received little or no attention in this country. Cities have been told that they must provide airports if they wish to attract air way traffic. They have been shown the means that they will receive from hangar rentals and other services, and they have made no concern. But little has been said of the pleasure, amusement and recreation that could be given to citizens by adding to the airport the air park

idea. There are many of us that do get from the large trunk line air routes that are reluctant to leave airports while they do not expect enough traffic. The air park idea may solve their difficulty. If they can establish a field where people can go for an afternoon cruise and see actual service operations, take afternoon flights and enjoy other amusements, a new opportunity will have been created for using airports.

Those who are being convinced by cities that already have small flying fields or large airports should give the air park feature very careful study. At Tempelhof Field in Berlin a very small addition is changed to the public, to the visitor and the enclosed air open air restaurant. For a small additional fee parties are taken by competent guides through the hangars and the various planes and facilities are described. This, not only creates an interest in flying, but gives an audience for the departure and arrival of passengers. As many as ten thousand persons have visited Tempelhof Field on a pleasant Saturday. If, instead of viewing airports wholly from the unsatisfactory standpoint of a broader public, there could be served, and there are public enterprises given the added advantage of a public park, there can be many other cities that might become interested. While so much enthusiasm is being shown in all parts of the country for the creation of airports it is only fair to these progressive communities to give them the newest phase in operation showed to them that they may profit by the recent ideas.

The municipal airports have become so numerous and so many government officials have taken an interest in bringing attention to their cities that every added argument that can be given to the public will increase the possibility for airports. There are airports. If every citizen feels that the establishing of an airport next to his city will give him, his family and guests another point of interest to visit he will take a very different attitude when money is spent on these new air constructions. The public cannot be expected to keep an airplane for reasons of a show and get some visible return. The air park idea has in a few additional sentences that may give the balance in favor of an airport in many cities.

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## A Merry Christmas

**WE** extend this Christmas greeting in the deepest sincerity and with all earnestness to every individual member of the great WACO family, wherever located.

To the WACO organization, "A Merry Christmas", should carry a deeper significance; it should mean "practice as well as precept", and should rise from every soul where service has found an unvalued field for operation. The real Christmas joys come from service wherever, each one has contributed something to the happiness of others.

The Christmas time, though founded upon the greatest event in human history, has become a period of universal giving and reciprocal pleasure, and yet loses its most joyful significance if, in giving, there be but the habit of custom. Nourishing of self must be incorporated in the gift to sweeten the emotions of those who give, as well as of those who receive. We can give ourselves without touching the pocketbook. Money and position, are as dust in comparison with those elements of work, friendship,

love, service — and the greatest of these is service.

The glory of friendship is service; the beauty of love is service. Not the service of the slave, not the service given per hour, or per dollar, not soulless labor, but the service that enters into the lives of our fellow beings with sympathy and helpfulness; the service of the cheery smile, of the encouraging word, and when necessary, the practical assistance — Service that forgets itself in the constant desire to Help-the-other-Fellow.

We make the world we live in, and our progress forward or backward, upward or downward, is through ourselves, and in all the cheer of Christmas time, with its innumerable evidences of practical good-fellowship, we should not forget that Christmas joys come from service, and the pleasure of this day can be enjoyed 365 times each year, if we live right, think right, act right and are helpful at all times to those about us.

Again, to all readers, A MERRY CHRISTMAS ! ! !



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